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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/573,064 | 03/23/2006 | Laurence Germond-Rouet | PHFR030114US | 6991 |

28159 7590 09/18/2008

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| EXAMINER | |
|---|---|
| LEACH, CRYSTAL I | |
| **ART UNIT** | **PAPER NUMBER** |
| 3737 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 09/18/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/573,064 | GERMOND-ROUET ET AL. | |
| | Examiner | Art Unit | |
| | CRYSTAL I. LEACH | 3737 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/26/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

Examiner notes that claim 1 invokes 35 U.S.C. 112, sixth paragraph.

### *Information Disclosure Statement*

1. The Information Disclosure Statements (IDS) submitted on March 23, 2006 is in compliance with 37 CFR 1.97 and 1.98. The references therein have been considered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz et al. (5,474,073) in view of Kadi et al.

Schwartz et al. teach an ultrasound imaging system (see abstract, l. 1-3; col. 1, 4-7) comprising: a probe (10) with an array of transducer elements (12) for acquiring ultrasound data of a body, including moving tissue and fluid flow (see abstract, l. 3; col. 2, l. 62-67); a beamforming system (16) for emitting and receiving ultrasound beams in said body (see col. 3, l. l. 2-12), which uses, for each transmission beam, an ensemble length temporal samples (see col. 3, l. 33-36); processing means (see fig. 1, ref. signs (18), (20), (22), (24), (26), (28)) to process flow Doppler signals (see col. 3, l. 21-23), comprising clutter demodulation followed by high-pass filtering (see fig. 1, ref. sign (20) and col. 3, l. 23-27); and display means (40) to display images based on said processed flow Doppler signals (see col. 4, l. 4-6). Schwartz et al. teach that the processing

means comprises a color flow velocity processor for mapping flow velocity values on color values (see col. 1, l. 61-65); that the processing means comprises a color power processor for mapping the estimated power magnitude on color values (see col. 2, l. 5-12); a B mode processor (30) for processing the amplitude information of the echo signals (RF), on a spatial basis, for the formation of structural images of the tissue (see col. 3, l. 44-47); a display processor (see fig. 1, ref. sign (32), (34), (42)) for processing the B mode data, color flow velocity data, color power data, and an image memory for memorizing the image data for display; and a user control for the user to select the images to display in one mode or in combined modes (see col. 4, l. 1-14).

Schwartz et al. do not explicitly teach an ensemble length of more than two temporal samples and less than eight or that the clutter demodulation being adaptive clutter demodulation when applied on amplitude signals and mean clutter demodulation when applied on phase signals. However, one of ordinary skill in the art understands that the frame rate depends directly on the ensemble length. Therefore, one skilled in the art would desire to diminish the ensemble length to values as indicated for example, in Kadi et al. (see p.928, left-hand column, l. 1-4). Moreover, Kadi et al. discloses that "a filter for power Doppler mode can be chosen on the basis of its ability to remove clutter power, irrespective of any mean frequency bias that may be introduced" (see p. 933, right-hand column, l. 9-11). Therefore, one of ordinary skill in the art would apply one of the adaptive filters as proposed in Kadi et al. (p.933, right-hand column, l. 12-23) in the power Doppler path. It is also obvious to those of ordinary skill in the art that utilizing a second order Infinite Impulse Response filter (IIR-filter) is a usual measure of

design. Furthermore, it would be obvious to one of ordinary skill in the art to obtain a filter with a steeply rising flank. Since there are more signal samples per volume available in the power Doppler path than in the velocity path, it would be obvious to one of ordinary skill in the art to use a third order IIR filter for the power Doppler processing path (see Kadi et al., fig. 9).

It would have been obvious to one of ordinary skill in the art to modify the invention of Schwartz et al. by applying adaptive clutter demodulation as taught by Kadi et al. in order to treat a wider array of clutter filtering conditions.

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hossack et al. (US 2002/0120195) teach medical ultrasound imaging methods for extended field of view and Hossack et al. (5,891,037) teach an ultrasonic Doppler imaging system with frequency dependent focus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRYSTAL I. LEACH whose telephone number is (571)272-5211. The examiner can normally be reached on Monday through Friday, 8 am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian L Casler/
Supervisory Patent Examiner, Art Unit 3737

/Crystal I Leach/
Examiner, Art Unit 3737